DOCUMENT RESUME

ED 428 643 HE 031 977

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TITLE	Students' Intentional Persistence as a Web of Causal Factors: A Preliminary Study II.
PUB DATE	1997-11-10
NOTE	52p.; For the preliminary study I, see HE 031 976.
PUB TYPE	Reports - Research (143)
EDRS PRICE	MF01/PC03 Plus Postage.
DESCRIPTORS	Academic Aspiration; *Academic Persistence; Developmental Studies Programs; *High Risk Students; Higher Education; Social Integration; Statistical Analysis; Student Adjustment; *Student Characteristics; Student College Relationship; Tables (Data)
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ABSTRACT

This study examined the impacts of institutional and instructional stressors on college students' intentional persistence. The study used a causal-comparative design with 219 students (188 developmental and 31 nondevelopmental) who had persisted beyond freshman and developmental curricula at Grambling State University (Louisiana). Of these students 48 were classified as unintentional persisters, 47 as intentional persisters, and 124 as socially or academically integrated (but not affiliated); also of the 219 students, 98 were co-integrated and 121 malintegrated. Participants were exposed to several endemic institutional risk factors that were considered to be "a web of causal stressors." The study examined the effects of six theoretical constructs, three exogenous latent variables (students' background characteristics, the institutional environmental system, and the instructional environmental system), and three endogenous latent variables (effective use of systems approach/principles in classroom by instructors, co-integration, and persistence). Findings indicated that: (1) 93 percent of students with the highest propensity for co-integration were co-integrated and all students at high risk for malintegration actually malintegrated; (2) 97 percent of co-integratable students were properly classified as either co-integrated or malintegrated; (3) 30 percent of students with the tendency for intentional persistence were improperly classified as unintentional persisters; and (4) the systems design and co-integration scales had the greatest impacts on intentional persistence. (Contains 73 references.) (DB)

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Students' Intentional Persistence As A Web of Causal Factors: A Preliminary Study II

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Fall Semester, 1997

November 10, 1997

IR 031 947

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Students' Intentional Persistence As A Web of Causal Factors: A Preliminary Study II

Abstract

This preliminary study used a comparative/predictive design and considered the impacts of institutional and instructional stressors on students' intentional persistence. Of the 219 post-developmental students: 48 (21.9%) were unintentional persisters, 47 (21.5%) were intentional persisters, and 124 (56.6%) were socially or academically integrated, but not affiliated; dnd 98 (44%) co-integrated and 121 (56%) malintegrated. Participants were exposed to several risk factors endemic within the institution. These risk sets are products of complex interactions that could be described as a "web of causal stressors." Students' high educational aspiration and their satisfaction with the parent institution affected their intent to persist and co-integrate within the institutional environment.

When added to a discriminant analysis based on six factor scales, results indicted:(1) About 93% of the sample with the highest propensity for co-integration co-integrated; 7% of the students had the marginal propensity for co-integration; and 100% of the students with the highest risk for malintegration actually malintegrated. (2) 96.8% of those co-integrable students were properly classified as either co-integrated or malintegrated. (3) 30.4% of those students who exhibited the tendency for intentional persistence were improperly classified as unintentional persisters. (4) The systems design and co-integration scales had the greatest impacts on intentional persistence. Their unique contributions to the canonical correlation (0.789) explained much of the variance in intentional persistence.

Students' Intentional Persistence As A Web of Causal Factors: A Preliminary Study II

Introduction

Institutional environmental stressors and characteristics mediate students' academic and social (socio-academic) integration into an institutional environment. Students' interactions within an institutional environment is longitudinal and multi-causal. Research that investigates the effects of students' ethnicity, affiliation, and institutional environment should begin to more fully explain the causes of minority student retention and attrition in predominated racial institutions (Allen, 1987; Barham & Ogunyemi, 1992, 1994; Castle, 1993). The five dominant models of student retention and attrition share some factors, including students' background characteristics at the time of initial entry and experiences that take place in the college environment. Sharing these background characteristics with group members predisposes individuals to identify with the group. Students develop a sense of belonging in the institutional environment based upon their concept of how other students and institutional personnel perceive them. Developing a sense of affiliation or disassociation, belonging or exile, co-integration or malintegration into an institutional precinct determines

whether a student persists or drops out (Boyer, 1984; Turner, Zias, & Gatewood, 1974; Tinto, 1975/88). Inadequate sense of membership, belonging or integration might help explain why some minority students drop out of predominantly White colleges and universities (PWCUs)and persist more in the PBCUs (Allen, 1987; Kalsner, 1991; Loo & Rolison, 1986; Tinto, 1988).

Specific Aims

The following specific aims were addressed:

1. To specify a model that took into account the impacts of the students' background characteristics and institutional environmental stressors (institutional and environmental systems) on perceived instructors' effective use of instructional systems approach/principles in classrooms, co-integration, and intentional persistence behavior of post-developmental college students.
2. To use a modified questionnaire obtained from the reviewed literatures on attrition-retention studies to help explain the outcome and the extent of co-integration in #1 above.
3. To determine how the proposed model in specific aim #1 differentially explained the intentional persistence behaviors in the sample.

Background and Significance

It is quite likely that the factors that influence the

variations in attrition-retention studies in previous research endeavors that did not include developmental learners and other students in the southern and south-eastern states of the United States may be different. This difference could be attributed to the differences in the samples, the effects of institutional environmental stressors, and instructors' characteristics. Whence, this pilot study sought to conceptualize a path model of factors that determine risk behaviors that have the potential to compel students to abort their educational pursuits.

Ever since the 1954 landmark Supreme Court case of Brown versus the Board of Education of Topeka, Kansas, efforts have been made to achieve greater desegregation at all levels of formal education. As a result of the gradual elimination of racially discriminatory barriers to higher education, more minority students began attending college in the 1960s and 1970s. However, an examination of students' college performance reveals that some formidable challenges remain to be faced by American colleges and universities in the quest for academic equality and educational opportunities for all (Anderson, 1984; Astin, 1975, 1982, 1985, 1990, 1993; Barham, 1992; Bean, 1985; Boyd, 1974).

We have also learned that African Americans and other minority students have the lowest retention and the highest propensity for attrition; tend to exhibit academic risk factors, which include previous academic (high school) history, cultural

and linguistic barriers, and low socioeconomic status); are mostly first-generation college students; and come from single or adopted family system (Allen, 1985, 1987, 1991, 1992; Allen & Nelson, 1987; Miller, 1990; Nettle, 1989; Nettles, Thoeny, & Gosman, 1986, 1987; Pace, 1979).

Institutional environments, student-faculty and peer-group interactions, perceived feeling of alienation or discrimination, and the racial composition of the student body within an institution had been cited as some of the factors that contribute to college students' increased attrition rates, decreased retention rates, and thus, the lack of academic and social incorporation within the institutional environment (Bean, 1981; Ikegulu, 1996; Nora & Cabrera, 1996; Pascarella, Duby, & Iverson, 1983; Terenzini, et al., 1996).

There are not enough research studies on students' attrition, persistence, and retention in Louisiana. The few that were published based their conclusions on pass rates, number of developmental courses taken by the students and number of such programs offered by the institutions, and the effectiveness of developmental education programs (Barham, 1992; Bonham, Boylan, & Bliss, 1993; Boylan, Bonham, & Bliss, 1994; Clark, 1983; Ferguson, 1991; Ikegulu, 1996). None of the studies included the instructional component as a causal factor. The fact remains that the quality of education is not only a measure of the students'

success in the degree program of study; but also a measure of the institutional commitment to educate the student, the students' commitment to seek help from "significant others" within the institution, and the effects of the instructors' teaching styles and commitments to both the student and the institution.

Another problem appears to be the lack of research on underprepared students, particularly African-Americans who attend predominantly Black colleges and universities (PBCUs). Although studies of retention and attrition began in the 1950's (Iffert, 1957; Pace & Stern, 1958), minority populations received little attention until about a decade before (e. g., Astin, 1982; Clark, 1983; Fleming, 1984; Nettles, 1989; Tinto, 1987; Nora & Cabrera, 1996). As minority student populations continue to grow, educators are examining the influence of cultural diversity in different college settings. Although statistics show that a greater proportion of African- Americans who attend PBCUs graduate when compared to those who attend PWCUs, limited research is directed at African-Americans in PBCUs. As the number of African-Americans in the general population continues to increase, and the proportion who graduate from college continues to dwindle, research efforts should be devoted to seek explanations for African-American attrition and retention as a necessary step to improving African-American persistence in higher education.

Theoretical and Conceptual Frameworks

Various models relating to attrition-retention (persistence) of college students have been tested (e.g., Nora & Cabrera, 1996; Pascarella, et al., 1983; Spady, 1970; Terenzini, et al., 1996; Tinto, 1975). The theoretical frameworks for this study was influenced by several models: students' involvement model, college drop-out model, dropout syndrome model, general causal model, and socialization model. These models are generally discussed within the conceptual frameworks of two interrelated theories: the person-environmental fit theory and the stages of student departure theory.

The person-environmental fit theory evaluates the degree of fit between an individual student and the institution (Bean, 1985; Nora & Cabrera, 1996; Pascarella, 1985; Pascarella, et al., 1983). This theory posited that students come to a postsecondary institution with a variety of traits (gender, family background, cultural norms, pre-postsecondary characteristics, different academic aptitudes, financial and personal needs, and family obligations). These background characteristics or entry-level characteristics lead to a student's initial commitment predicated upon his or her academic ability, study habits, and level of motivation. These initial commitments, together with entry-level characteristics and the student's academic aptitude collectively influence his or her decision to withdraw or remain within an

institutional environment provided that the student feels or perceives a sense of belonging (fit) or alienation (lack of fit) within the institution. The perceived feeling of alienation perpetuates the student's degree of co-integration (or malintegration thereof) predicated upon his or her ability to interact (formally and informally) with institutional personnel and other students. Students' commitment to the institution, the institution's aggregate commitment to the student, and familial influence on the student's decision-making collectively affect the student's persistence behavior (Castle, 1993; Dial, 1987; Nora & Cabrera, 1996; Spady, 1970; Tinto, 1975, 1997).

The stages of student's departure theory postulated that the institutional environmental stressors on the student are the cumulative results of a set of interrelated experiences sustained over an extended period of time (Ikegulu, 1996, Terenzini, et al., 1996; Tinto, 1975, 1988); and that the process of a student's departure is longitudinal and depends on his or her level of motivation and involvement within the institution. This theory presumes that as a student progresses through these stages -- initial stage with entry-level characteristics and initial goals and aspirations, to the median stage with refined study habits and personal and institutional goals and commitments, to the terminal stage with realized expectations -- the student's persistence behavior is temporally affected through sustained

endurance and improved levels of familial support and family obligations as well as levels of institutional and community activities and involvement (Ikegulu, 1996, Pascarella, et al., 1983; Tinto, 1975, 1988).

Methodology and Analytical Procedures

Research Design

Supplement to the retrospective predictive design, we used the structure and plan (design) which emphasized a need to focus on the interrelationships of latent constructs in the proposed model. This design is referred to as ex-post facto or causal-comparative design (Crowl, 1996; Fraenkel & Wallen, 1996; Kerlinger, 1986; Krathwohl, 1993; Pedhazur & Schmelkin, 1991). Although interests were in the effects of the exogenous independent variables or latent structures on the endogenous dependent variables and their resultant direct and indirect effects, actual investigations were on pre-existing and intact groups. That is, the study consisted of students who already exhibited different risk indicators of interest. As such, it was not a true experimental design that tested the effectiveness of specific treatments on the sampled population.

Research Hypotheses

Included for consideration were six theoretical constructs (See Table 1): three exogenous latent variables (students'

background characteristics, institutional environmental system, and instructional environmental system) and three endogenous latent variables (effective use of systems approach/principles in classroom by instructors, co-integration, and persistence).

The pattern of causal inquiries that were investigated are:

1. Students' background characteristics have direct effects on institutional and instructional environmental systems, and effective use of systems approach/principles in classrooms.
2. Institutional and instructional environmental systems are interrelated, and both have: (1) Direct effects on effective use of systems approach/principles in classroom and students' co-integration. (2) Indirect effects on students' co-integration as mediated by the instructors' effective use of instructional systems approach/principles in classroom.
3. Instructional system has a direct effect on students' ability to co-integrate within an institutional environment.
4. Students' persistence behaviors are the direct consequences of students' co-integration abilities as measured by the composites formed by social and academic integration and need for affiliation.

Table 1

Latent Structures and Indicators

Latent Structures	Indicators/Composites of Items
Students' Background Characteristics [Exogenous]	Composites formed by: Students' Characteristics (Age, Ethnicity, Gender, Choice of major, Weekly hours of study time, Weekly hours of T.V. time, Number of dependent children, and Degree aspiration), Socioeconomic status (Amount of financial Aid award, Father's level of education, and Mother's level of education), Family background, Family size, and Family encouragement/ support (24 - 27).
Institutional Environmental System [Exogenous]	Composites formed by: Students' Activities (Weekly hours of school activities, Number of school activities, Honor's program, On-campus employment, Weekly hours of community activities, Number of community activities, off-campus employment, and Attended institution's orientation, Observed Racism (28 - 34), Personnel concern for students (40 - 46), and Peer-group interactions (47 - 52).
Instructional Environmental System [Exogenous]	Composites formed by: Instructors' Characteristics (89 - 93) and Instructors' Attitudes (72 - 76).
Effective Use of Systems Approach in Classroom (INSTR-SYS) [Endogenous]	Composites formed by: Conducting Analysis (77 - 83), Focus on Students (84 - 88), Determining Objectives (93 - 99), and Value of Training (100 - 104).

Co-integration (COINTG) [Endogenous]	Composites formed by: Social Integration (35 - 39), Academic Integration (57 - 63) and Need for Affiliation (53 - 56). Co-integration is further grouped:- 1 = student is co-integrated 2 = student is not co-integrated 3 = student is unaffiliated but is academically or socially integrated
Intentional Persistence [Endogenous]	Likelihood to transfer and/or re-enroll in the institution next term (Intent to persist) (64 - 71)

Population, Sampling, and Instrumentation

Detailed accounts of the target population, sampling procedures, and instruments used in this second preliminary study are as contained in the first pilot study.

Variable Identification and Definition of Terms

The collected data were operationalized as follows:

AGE Student's age (determined as AGE = 9702 - DOB)

SEX Student's gender (1 = male, 2 = female)

RACE Student's ethnicity (1 = White, 2 = Black, 3 = Hispanics, or 4 = Others)

Students' Background Characteristics

An exogenous latent variable that impacts students'

ability/study habits and familial support as well as the institutional environmental stressors. This variable is characterized by the individual student's characteristics and personality traits (age, gender, ethnicity, and choice of major) and the students' number of dependent children, weekly hours of T.V. viewing and study time, and degree aspiration. This construct also taps on the parental influence on students' decision-making abilities and includes such indicators as students' financial aid awards, family size, background, and level of education, as well as other family support indicators.

Institutional Environments

Institutional environments vary greatly depending upon the type and mission of the institution. Institutional characteristics differ across institutions but within one institution, the aggregate of characteristics prevalent at the parent institution will constitute the institutional environment. These include students, faculty/staff and administrators, infrastructures, policies on admissions and registration procedures, and enforcement of rules and regulations.

Institutional Environmental Systems. An exogenous latent variable that includes the out-of-class environments

within the parent institutional environment. It is characterized by the students' involvement in school related activities, perceived/observed racism and/or discrimination, participation in institutional orientation, academic related activities, participation in honors program, on-campus employment, faculty/staff-student informal interactions, peer-group interactions, off-campus employment, and institutional personnel concern for students' development and teaching.

Instructional Environmental System. An exogenous latent variable that includes the classroom environment within the parent institutional environment. It is characterized by institutional instructors' attitudes and characteristics (age, gender, level of education, longevity, and/or charisma).

Effective Use of Instructional Systems Approach/Principles

An endogenous latent variables that taps on the instructors' effective use of systems approach principles in their classrooms. It is characterized by the four factorially derived sub-scales of the Teacher Planning Inventory (Branch, 1994): conducting analysis, determining objectives, focus on students, and value training. Instructional systems design (ISD) is a complex integrated process that involves people, procedures, ideas,

devices, and organization, for analyzing problems; and devising, implementing, evaluating, and managing solutions to these problems in a controlled learning and purposive situation (Heinich, Molenda, Russell, & Smaldino, 1996, p. 411).

Conducting Analysis. The students' perceptions about the majority of their instructors' assessment of the student, learning tasks, and the learning context to facilitate the realization and achievement of instructional goals in the classroom.

Determining Objectives. The students' perceptions about the majority of their instructors' development of instructional strategies using appropriate organizational, management, and delivery techniques to effect learning, induce motivation, and enhance recall.

Focus on Students. The students' perceptions about the majority of their instructors' development of student-centered and learner-empowered instructional strategies and fairness in grading.

Value Training. The students' perceptions about the majority of their instructors' incorporation of feedbacks from colleagues and "significant others" into the instruction for

identification, organization, and implementation of lesson plans in their instructional materials.

Co-integration

An endogenous latent variable that determines the extent of co-integration or malintegration within an institutional climate. People co-exist in an community when they live together (Tinto, 1988). A student can be integrated into an institutional environment if he or she is either academically integrated or socially incorporated into that environment (Astin, 1970, 1975, 1990; Bean, 1981/85 Tinto, 1975/88; Pascarella, et. al., 1983; Terenzini, et. al., 1996). Students who are academically integrated have the `marginal propensity' to persist more than those who are socially integrated (Tinto, 1988; Terenzini, et. al., 1996). A co-integrated student is the student who is both academically and socially integrated into an institutional environment. A malintegrated student is one who is not co-integrated. Hence, co-integration is the `propensity' to withstand the forces of attrition by socially and academically co-existing within an institutional environment.

Academic Integration. The academic climate or culture in an institutional setting. This is a multi-dimensional measure

of the ability of the student to withstand the academic rigors and competition within the academic system. It is characterized by the student's academic performance (student's ability to meet the requirements and curricula demands) and intellectual or personality development (student's ability to identify with and relate to the norms and requirements of the academic system).

Social Integration. The social climate or culture within an institution. This is a multi-dimensional measure of social interactions and the degree of congruency between a student and the social environment within his or her parent institution characterized by social "fitness" or "unfitness". Social integration is characterized by the formal and informal interactions between the student and the "significant others" (faculty, staff, administrators, students, and peers) within the institutional system in a supportive and affiliative manner.

Affiliation. This is the degree of congruency perceived as a "social fit" (an affiliated student) or a "lack of social fit" (an unaffiliated student). It is characterized by the factorially derived sub-scales of the Interpersonal Orientation Scale (Hill, 1987).

Intentional Persistence

An endogenous latent variable characterized by: students' likelihoods to transfer to another institution, graduate from the current institution, or remain in the institution and complete a degree program. This is the proportion of students who are still in school, and are still in pursuit of their academic goals. Persistence is the result of students' experiences while attending college, and not what happened before. Persistence is a measure of the degree of co-integration.

Retention. Proportion of students who were initially admitted and enrolled in their parent institutions or transferred to another institution, and are still in pursuit of their academic goals. These are the students with positive identification with the institution and are most likely to exhibit the propensity for intentional persistence.

Attrition. Attrition is the lack of compatibility between the student and the institutional environment. Attrition is the proportion of students who have the least need for affiliation and exhibit the highest propensity for unintentional persistence.

Pragmatically, students who are co-integrated are affiliated and those who are malintegrated are not affiliated. A socially or

academically integrated student may or may not be affiliated. Therefore, co-integration as used in this study was coded 1, if the student was both academically and socially integrated (institutionalized); 2, if the student was: (a) affiliated but academically unintegrated, or (b) affiliated but socially unintegrated; and 3, if the student was neither academically nor socially integrated (uninstitutionalized).

Results and Discussion

The sample could be characterized as homogeneous with age (Mean = 21.89 years and SD = 4.53) ranging from 17 to 47, had occasionally observed or perceived institutional discrimination, and had the least institutional affiliative need and the highest propensity for attrition. The majority of these students were not honors students and did not attend the institution's orientation.

Of these 219 post-developmental students, 48 (21.9%) were unintentional persisters, 47 (21.5%) were intentional persisters, and 124 (56.6%) were socially or academically integrated, but not affiliated. Furthermore, 121 (56%) of the studied population were malintegrated and 98 (44%) integrated. These large variance of co-integrated versus malintegrated and intentional versus

unintentional persisters were explored with the discriminant procedure.

Table 2 is a summary of the means (and standard deviations), the regression weights, and the simple (Pearson Product Moment) correlation for the factorially derived scales with intent to persist. These scales and their associated composites indicated that the full regression model (although significant) does not adequately predict the effects of these latent variables on students' intentional persistence. The model only explained 51.6% of the total variance in intentional persistence. The simple correlation coefficients for these scales are statistically significant at the five percent level of significance. This lack of fit is the consequence observed in the factor analysis and the reliability estimates. The full regression model is given by:

$$Y_{ij} = \beta_1 X_{i1} + \beta_2 X_{i2} + \beta_3 X_{i3} + \beta_4 X_{i4} + \beta_5 X_{i5}$$

Table 2

Number of Items per Scale, Means (standard Deviations), Beta (for the Full Model), and Pearson Correlation with Intent to Persist

Scale	Number of Items	Mean (Std Dev)	Beta	"r"
Students' Background Characteristics	21		-0.076	-.158*
Students' Characteristics		4.83(0.79)		
Socioeconomic Status		2.42(0.50)		
Familial Influence on Students' Decision-making		1.51(0 70)		
Institutional Environment	26		0.075	.146*
Students' Activities		1.86(0.34)		
Observed racism		3.85(0.94)		
Personnel Concern for Students		2.54(0.90)		
Peer-Group Interactions		2.51(0.80)		
Instructional Environment	10		0.091	.345**
Instructors' Attitudes		2.43(0.76)		
Instructors' Characteristics		2.43(0.78)		

Effective use of Systems Designs	23		0.177*	.414**
Conducting Analysis		2.46(0.80)		
Focus on Students		2.60(0.84)		
Determining Objectives		2.58(0.83)		
Value Training		2.56(0.88)		
Co-integration	16		4.08**	.471**
Social Integration		2.54(1.09)		
Academic Integration		2.46(0.84)		
Affiliation		2.70(0.84)		
Intent to Persist	8	2.45(0.64)	N/A	1.000
Overall Instrument	104	N/A	N/A	N/A
Significant F-test for the Full Model = 15.42 (p-value= 0.00) Coefficient of Multiple Determination = 0.516 Error Mean Square (MSE)= 0.305				

Note.
* $p < 0.05$ and ** $p < 0.01$.

where $\mathbf{Y_{ij}}$ = Students' Intentional Persistence,

β_j = Betas (the standardized regression coefficients for the factor scales), and

X_{ij} = The (latent variables) or factor-scales; for i = 1, ..., 219 and j = 1, 2, 3, 4, & 5. Specifically,

X_{i1} = Students' Background Characteristics

X_{12} = Institutional Environmental System

X_{13} = Instructional Environmental System

X_{14} = Instructors' Effective Use of Systems Design

X_{15} = Students' Co-integration

The scale alphas together with their measures of central tendency and the simple correlations indicate that the scales were adequate in predicting the overall model and its goodness-of-fit. These scales were used in the factor analyses procedures.

A maximum likelihood factor analysis procedure that used the composites was employed with mean-substitution. Table 3 summarizes the results of this procedure and the reliability estimates of the IISI survey. Although the 81 items in the instrument were measured on Likert scale, the initial principal component factor analysis yielded an ill-conditioned situation of the correlation matrix. The mean-substitution option was then employed. This also proved abortive because some of these items are categorical. With the Maximum likelihood option, these items were factor analyzed and the items that clustered together were used as composites. These composites were deemed necessary to

Table 3

Factor Loadings and Alpha Reliabilities

Scales/Composites	Factor Loadings	Scale Alpha
Students' Background Characteristics		0.353
Students' Characteristics	0.876	
Socioeconomic Status	0.575	
Familial Influence on Students' Decision-making	0.725	
Institutional Environmental System		0.121
Students' Activities	0.787	
Observed racism	0.580	
Personnel Concern for Students	0.728	
Peer-Group Interactions	0.475	
Instructional Environmental System		0.260
Instructors' Attitudes	0.735	
Instructors' Characteristics	0.631	
Effective Use of Systems Approach in Classroom		0.898
Conducting Analysis	0.869	
Focus on Students	0.818	
Determining Objectives	0.875	
Value Training	0.794	
Co-integration		0.628
Social Integration	0.432	
Academic Integration	0.621	
Affiliation	0.743	
Intentional Persistence	0.470	0.416
Overall (Six-factor Model)		0.7726
Overall (IISIS) Instrument Alpha		0.7886

improve the maximum likelihood estimates of the factor scores, loadings, and pattern matrix. This procedure yielded 11 factors with eigenvalues ranging from 0.235 to 6.872 and explained about 65.4% of the variance in the correlation matrix.

These composites were then subjected to another factor analysis. The scree plot yielded a solution of six factors with factor loadings ranging from 0.432 to 0.876 and accounted for 55.4% of the total variance. A cut-off point of 0.4 was used in both factor analyses procedures.

From the path diagram (Figure 1), two significant paths are obvious: (1) the relevant institutional environment path from students' background and characteristics through the institutional environment to the effective use of systems design and beyond; and (2) the supportive instructional environment path from students' background and characteristics through the instructional environment to the effective use of systems design and beyond. Collectively, both paths explained much of the variance in intentional persistence.

Results of the path analysis are consistent with the factor analysis as evidenced in the reliability estimates. Overall, about 55.4% and 51.6% of the total variance in intentional

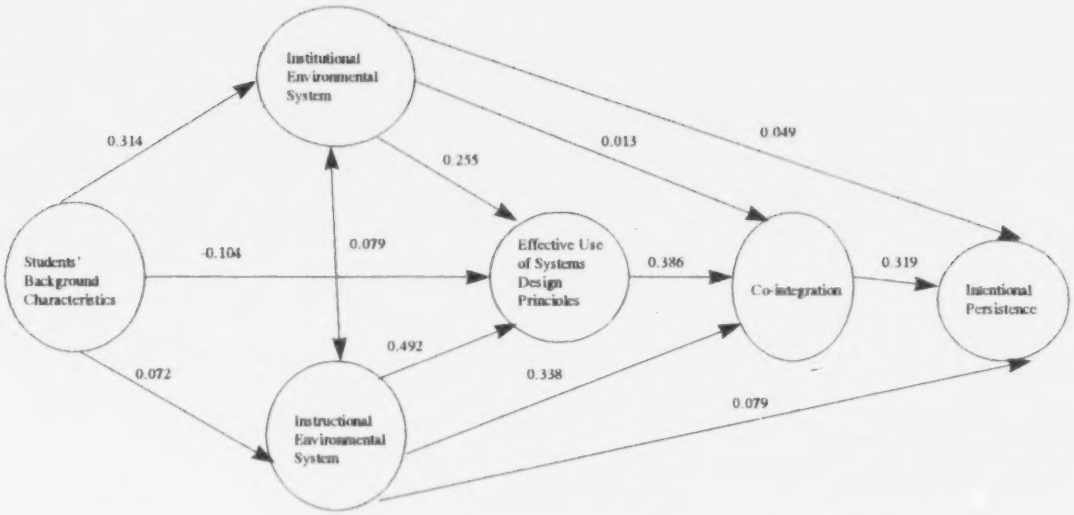

Figure 1
Post-Developmental Students' Intentional Persistence Model II: A Path Diagram (Ikegulu, 1997)

persistence were explained by the factor and path analyses. The overall reliability estimate for the instrument is 0.789. These indicators were judged adequate for the type and scope of this investigation (Ikegulu, 1996).

Discrimination was an integral part of this study because it allowed the separation of those participants in the sample with

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Table 4

Classification Results and Predicted Group Membership

(A) Intentional and Unintentional Persisters

Group Membership	Unintentional Persisters [UNPERST]	Intentional Persisters [INPERST]	Unaffiliated, but Socially and Academically Integrated [UAF/SOC-ACA]	Total
[UNPERST]	37 (78.7%)	1 1.1%)	9 (19.1%)	47(21.5%)
[INPERST]	4 (8.3%)	37(77.1%)	7 (14.6)	48(21.9%)
[UAF/ SOC-ACA]	26 (21.0%)	20 (16.1)	78 (62.9%)	124(56.6%)
Total	67 (30.6%)	58(26.5%)	94 (42.9%)	219
	Canonical Correlation (R^2 = 0.675) Wilk's Lambda = 0.502 Chi-Square = 144.32 with 28 degrees of freedom (p-value = 0.0000)			

(B) Malintegrated and Co-integrated Groups

Group Membership	Malintegrated [MALINT]	Co-integrated [COINT]	Total
[MALINT]	121 (100%)	0 (0.00%)	121 (55.3%)
[COINT]	7 (7.1%)	91 (92.9%)	98 (44.7%)
Total	128 (58.4%)	91 (46.6%)	219
	Canonical Correlation (R^2 = 0.829); Wilk's Lambda = 0.313; and Chi-Square = 242.34 with 17 degrees of freedom ($p < 0.001$)		

different characteristics and predicts the likelihood of their being classified to a particular group. Table 4 summarizes the results of the discriminant analyses. Results of the discriminant analyses predicted about 69.4% of students correctly classified as unintentional persisters, intentional persisters, and unaffiliated, but socially and academically integrated students; and about 96.8% of those students who are malintegrated or co-integrated within the institution.

From Table 4(a), about 20.2% of the 47 unintentional persisters were misclassified, 32.9% of the intentional persisters were misclassified, and 30% of the unaffiliated, but socially and academically integrated students were misclassified. These large ratios of proper and improper classification of students reflected in the overall prediction with about 69.4% of the students correctly classified into these three groups. About 3% and 2% misclassification errors within the malintegrated and co-integrated groups are deemed insignificant (Pascarella, et al., 1983). A somewhat realistic picture is observed in Table 4(b). Students who exhibited the risk for malintegration actually malintegrated. Of the 98 students who had the highest propensity

Table 5

Decomposition of Causal Effects in the Path Model

Causal Factors	Causal Effects		
	Direct	Indirect	Total
On Institutional Environmental System:			
Of Students' Background Characteristics	0.314	0.000	0.314
On Instructional Environmental System:			
Of Students' Background Characteristics	0.072	0.000	0.072
On Effective Use of Systems Design:			
Of Institutional Environmental System (IES)	0.255	0.00	0.255
Of Instructional Environmental System (InES)	0.492	0.00	0.492
Of Students' Background Characteristics(Through IES)	-0.104	0.080	-0.024
Of Students' Background Characteristics(Through InES)	-0.104	0.035	-0.069
On Students' Co-integration:			
Of Instructors' Effective Use of Systems Design	0.386	0.00	0.386
Of Students' Background Characteristics(Through IES)	0.013	0.004	0.017
Of Students' Background Characteristics(Through InES)	0.338	0.024	0.362
On Students' Intentional Persistence:			
Of Co-integration	0.319	0.00	0.319
Of Institutional Environmental System (Through Co-integration)	0.049	0.004	0.053
Of Instructional Environmental System(Through Co-integration)	0.079	0.108	0.187

Note. 1. IES means Institutional Environmental System
2. InES means Instructional Environmental System

for co-integration, about 93% of them actually co-integrated, while only seven percent had the marginal propensity for co-integration. That is, about 7% of those students who were supposed to co-integrate malintegrated. Consistent with Figure 1, Table 5 is a summary of the decomposition of causal effects in the path diagram. This table was used to test the proposed hypotheses. These hypotheses are consistent with specific aims #1 and #3. The total effects are the sum of the direct and indirect effects of a particular causal link (path).

To reject any of the null hypotheses would mean that few of its component parts were not satisfied. If any of these components were satisfied, the hypotheses would be partially accepted/rejected. Acceptance of any of the hypotheses would mean that all of its components were satisfied.

H_{01}. **Students' background characteristics did not have direct effects on institutional and instructional environmental systems, and instructors' effective use of systems approach/principles in classrooms.**

This hypothesis tested the significant direct causal links from students' background characteristics (SBC) to institutional environmental system (IES), instructional environmental system

(InES), and instructors' effective use of systems design principles (SYST). From Figure 1 and Table 5, SBC have significant direct effects on IES, an insignificant direct impact on InES, and an inverse effect on SYST. Therefore, this hypothesis is partially rejected.

H_{02}. **Institutional and instructional environmental systems were not interrelated, and both did not have: (1) Direct effects on instructors' effective use of systems principles in classroom and students' co-integration. (2) Indirect effects on students' co-integration as mediated by instructors' effective use of instructional systems principles in classroom.**

This is a two-part hypothesis that tested the collective effects of the direct and indirect causal links of instructional and instructional environmental systems on instructors' effective use of systems design principles in their classrooms and the intercorrelation between both institutional environments. First, instructional environmental system has a significant ($\beta = 0.492$, $p < 0.001$) and institutional environmental system has a significant ($\beta = 0.255$, $p < 0.001$) causal links and no indirect effects on SYST. Second, both institutional environments (i.e, IES & InES) have significant correlation ($\Phi = r = 0.079$, $p < 0.001$). This hypothesis (H_{02}) was rejected.

H_{03}. **Instructors' effective use of instructional system design did not have a direct effect on students' ability to co-integrate within their parent institutional environment.**

The obvious significance of institutional faculty's effective use of systems design principles in their classrooms on students' co-integrability (COINTGRA) was a direct consequence of the importance of this construct in this study. Instructors' effective use of systems design principles was perceived by the participant as an important factor in their academic integration, social integration, and affiliation within their parent institutions. The composite (conducting analysis, determining objectives, value training, and student focus) of the instructors' effective use of systems design principles in their classrooms were collectively significant ($\beta = 0.386$, $p < 0.001$) Hence, this hypothesis (H_{03}) was rejected.

H_{04}. **Students' persistence behaviors were not the direct consequences of students' co-integration as measured by the composites formed by social integration, academic integration, and affiliative need; as well as the influential factors from the institutional and instructional environments.**

This hypothesis tested the combined effects of institutional

instructional environmental system and, COINTGRA on students' intentional persistence (PERSIST). Persistence is a consequence of the global effects of the factors and their composites in determining which of the sampled students would become an attrition statistic. Both institutional environmental (β = 0.049, p < 0.045) and instructional environmental system (β = 0.079, p < 0.050) have marginally significant direct effects on students' intentional persistence. Students' co-integration has a very significant direct (β = 0.319, p < 0.001) and no indirect effect on PERSIST; instructional environment has a significant indirect path (as mediated through COINTGRA) to PERSIST; and institutional environmental system does not have an indirect effect (through COINTGRA) on PERSIST. Whence, I failed to accept H_{04}.

Summary and Conclusion

Our expectation for undertaking this complex investigation was that information gained from it would be used to build and evaluate linear structural equation models that represent theoretical formulations about persistence behaviors for larger samples of students. Granted the fact that some of the indicators (high school and college cumulative GPAs, ACT/SAT score, high

school information, and other predictive indicators) that could lead credibility to this preliminary investigation were not included (as opposed to the first one) in this study, the results were affected with less handicapment. These results were as enumerated in the factor, path, and discriminant analyses.

The factorially derived constructs were justified from evidence in the reviewed literatures on attrition-retention studies (Clark, 1983; Ikegulu, 1996; Keith, et al., 1986; Pascarella, et al., 1983; Terenzini, et al., 1996; Tinto, 1997).

This investigation had added a new dimension to the attrition-retention studies by explaining some of the reasons college students remained to complete a degree while others dropped out in a predominantly Black institution. All of the studies and models reviewed included entry-level characteristics, students' assessment measures, and student' ability to co-integrate within an institution (academic integration, social integration, faculty and peer-group interaction), intellectual growth and developments, and persistence. What these models and studies lack, however, is the instructional systems component. This was included in the conceptualization of the Students' Intentional Persistence Model. This component happened to be the

most significant factor (explained about 34% of the variance) in the intentional persistence for post-developmental students.

In the literature reviewed related to instructional technology, the authors found that the instructional systems approach has met with skepticism (Earle, 1994). However, Bloom (1976), Glasser (1976), Scandura, (1964, 1989), Snelbecker (1989), Driscoll (1993), and Driscoll, et al. (1994) agreed that the instructor has the major responsibility for students' learning. As people became more aware of instructional designs in the 1960's, its popularity grew. Colleges and universities incorporated it into their instructional programs in the 1970s. The 1980s brought a diminishing dollar and the perception that instructional design processes were not essential (Kemp & McBeath, 1994). Studies have found that classroom integration of instructional design processes are beneficial (Branch, 1992, 1994; Reiser, 1994).

Systems approach principles and practices are under utilized at the postsecondary institutions. None of the reviewed studies on instructional design used age, gender, or both as main factors; rather they were used as stratification variables. Perhaps, the merits of instructional design should be revised to

include the results from recent research studies. Instructional design has the potential to enhance student learning (Branch, 1992, 1994; Branch, et al., 1992). This research endeavor replicated findings that supported Branch's (1994) findings.

Results also indicated that: students' background characteristics were influenced by many factors including age, gender, choice of major, dependent children, and institutional involvement (Turner, Zias, & Gatewood, 1974; Kulik, Kulik, & Schwalb, 1983; Purvis & Watkins, 1987); student-faculty interaction and institutional personnel concern for students, peer-group interactions, institutional climate and culture, and instructors' attitudes and characteristics were interrelated and posed significant effects on the instructors' effective use of systems approach principles in classrooms (Astin, 1993; Branch, 1992, 1994; Endo & Harpel, 1981; Gaff & Gaff, 1981; Lamport, 1993; Terenzini, Theophilides, & Lorange, 1984); high educational aspiration of the students and their satisfaction with the parent institution affected their intent to persist and co-integrate (Allen, 1992; Astin, 1993; Lamport, 1993). These risk sets are a product of complex interactions that could be described as a "web of causal stressors."

When added to a discriminant analysis based on the six factorially derived constructs, several trends were noted: (1) About 93% of the students with the highest propensity for co-integration co-integrated, 7% of the sample had the marginal propensity for co-integration, and 100% of the sample with the highest risk for malintegration actually malintegrated. (2) 96.8% of those co-integrable students were properly classified as either co-integrated or malintegrated. (3) 30.4% of the sample who exhibited the tendency for intentional persistence were improperly classified as unintentional persisters. (4) The systems design and co-integration scales had the greatest impacts on students' intentional persistence. Their unique contributions to the canonical correlation (R^2 = 58.3%) explained much of the variance in students' intentional persistence behaviors and the overall canonical correlation for the factorially derived scales was 0.789.

A major challenge to developmental educators, researchers, and policy makers is to determine the factors that individually and collectively impact persistence behaviors of students in higher education. The conceptual model that guided this preliminary investigation showed the pragmatic significance of

both the institutional and the instructional environments on students' intentional persistence behaviors. We offered this model because it is clear that no single factor emerges as the major reason for postsecondary attrition-retention behavior (Ikegulu, 1996; Terenzini, et al., 1996; Tinto, 1988/97). Indeed, attrition and retention (or persistence) are known to be behaviors with multiple determinants. Their causes may be identified by characteristics of culture, language, ethnicity, age, gender, socioeconomic status, academic histories, and socio-academic integration. These causal stressors are the risk factors endemic in postsecondary institutional environments, students' home environments, and those environments both the students and the institution are constantly interacting.

The practicality of the institutional environments, characterized by the institutional and instructional environmental systems, were a consequence of how students perceived their instructors' attitudes and teaching effectiveness during classroom instruction. Students who exhibited the highest propensity for institutional affiliation tended to be highly socio-academically integrated within the institution. Those students who felt a sense of alienation tended to be "stand-

offish," or exhibited "shy syndrome;" and usually blamed their failures on institutional personnel, curricula offering, and/or social incontinent. Stand-offish students are those students who are social outcasts, tend to stay alone, and feel alienated from the rest of the students; whereas, the students who exhibit the shy syndrome have the tendency to be socially active but at the same time feel alienated from the rest of the student population.

Interpersonal indicators such as instructors' teaching methods, empathy, charisma, and grading style, may indeed account for students' intentional persistence behaviors.
This type of thinking could work to invalidate students' perceptions of their instructors' teaching effectiveness. However, it could also stand as a test of validity for the teacher planning routines instructors employ in their classrooms. For example, if institutional faculty want to retain more and better students, all they have to do is incorporate educational technology into their curricula and integrate the principles of instructional design into their classroom instruction to accommodate students' background behaviors; and be lenient in their grading style and institutionalize an institution-wide intervention program that will monitor students progress. The

design of an instructional unit that fits an entire curriculum and campus-wide intervention programs could be explained by two hypotheses, student-centered instruction and student-oriented instructors.

The 'student-centered instruction' hypothesis posits that better expected course grades reflect better student learning; and designing the instruction to meet students' need will foster better students' understanding of the instruction. Moreover, positive correlations between learning and students' retention and, learning and instructors' teaching methods support the student-centered instruction of the students' perception in their classroom environments (Branch, 1992, 1994; Brown, 1991; Clark, 1989; Clark & Peterson, 1986; Kinney & Smith, 1992). The 'Student-oriented instructors' hypothesis proposes that pre-existing students' variables such as prior knowledge base, gender, age, interest, prerequisite skills, and learning styles; and the instructors' characteristics such as age, gender, instructional experience, rank, teaching load, grading style, and teaching methods, may affect students' learning outcomes, teaching effectiveness, students grades and evaluation of instruction and the instructor, and persistence (Clark, 1989;

Dial, 1987; Driscoll, 1993).

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